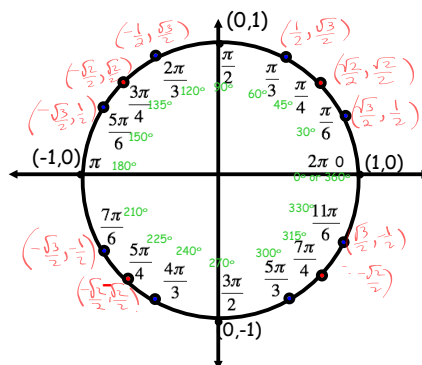


Precalc Warm Up # 7-2

Find:

1. $\operatorname{arccot}(-\sqrt{3})$
2. $\arctan 0$
3. $\arccos(\cos \frac{7\pi}{2})$
4. $\sec(\arctan 3x)$
5. $\csc(\arctan(-\frac{5}{12}))$



HW Questions: p. 380

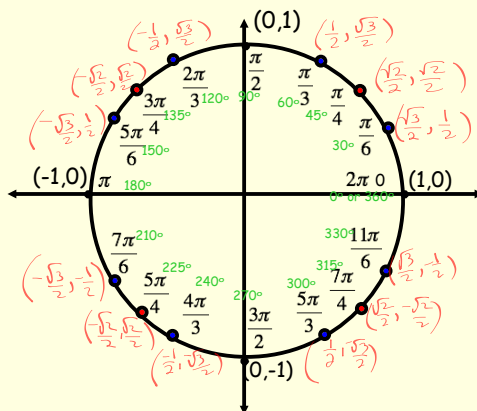
In Exercises 1–16, evaluate the given expression without using a calculator.

3. $\arccos \frac{1}{2}$

7. $\arccos\left(-\frac{\sqrt{3}}{2}\right)$

9. $\arctan(-\sqrt{3})$

13. $\arcsin \frac{\sqrt{3}}{2}$



In Exercises 17–28, use a calculator to approximate the given value. [Round your answers to two decimal places.]

17. $\arccos 0.28$

21. $\arctan(-2)$

27. $\arctan 0.92$

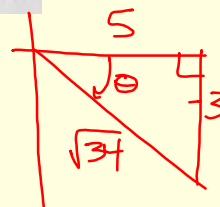
31. $\cos[\arccos(-0.1)]$

In Exercises 35–42, find the exact value of the given expression without using a calculator. [Hint: Make a sketch of a right triangle, as illustrated in Example 6.]

35. $\sin(\arctan \frac{3}{4})$

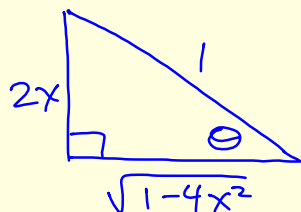
41. $\sec[\arctan(-\frac{3}{3})]$

$\sec \theta$
 $\frac{h}{a}$



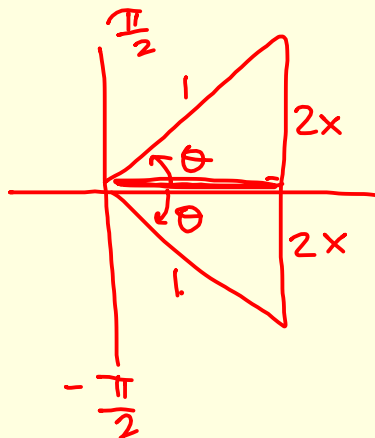
In Exercises 43–52, write an algebraic expression that is equivalent to the given expression. [Hint: Sketch a right triangle, as demonstrated in Example 7.]

45. $\cos(\arcsin 2x)$

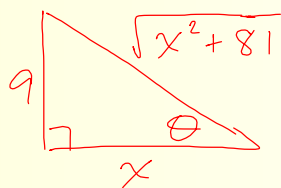


$$\cos \theta = \sqrt{1-4x^2}$$

49. $\tan\left(\arccos \frac{x}{3}\right)$



53. $\arctan \frac{9}{x} = \arcsin(\quad)$



61. A photographer is taking a picture of a four-foot painting hung in an art gallery. The camera lens is one foot below the lower edge of the painting (see figure). The angle β subtended by the camera lens x feet from the painting is given by

$$\beta = \arctan \frac{4x}{x^2 + 5}$$

Find β when (a) $x = 3$ feet and (b) $x = 6$ feet.

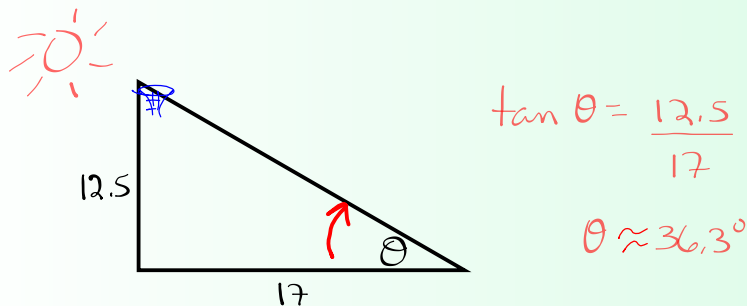
$$\begin{aligned} \text{a) } \beta &= \arctan \frac{4(3)}{3^2 + 5} \\ &= \arctan \frac{12}{14} \\ &= \arctan \frac{6}{7} \end{aligned}$$

Applications involving both right triangles and non right triangles.

The height of the top of an outdoor basketball backboard is 12.5 ft and the backboard casts a shadow 17 feet long. Find the angle of elevation of the sun in degrees rounded to the nearest 10th of a degree.

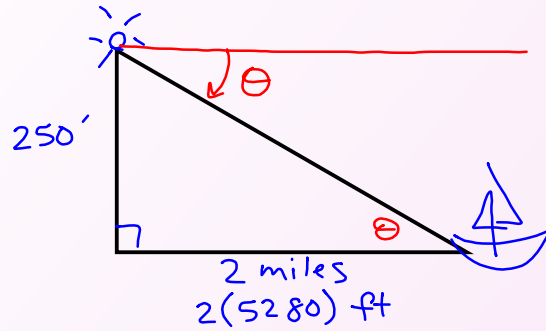
Applications involving both right triangles and non right triangles.

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Find the angle of depression (to the nearest 10th of a degree) from the top of a lighthouse 250 feet above water level to the water line of a ship 2 miles offshore.

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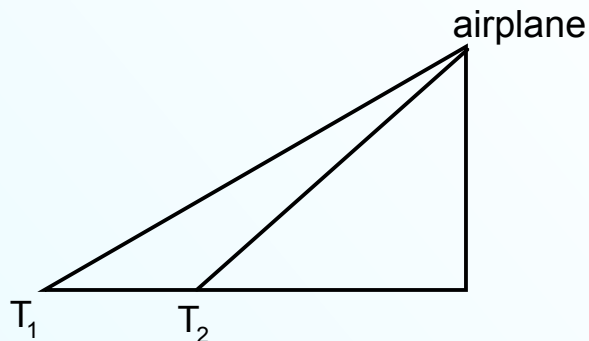


$$\tan \theta = \frac{250}{2(5280)}$$

$$\theta \approx 1.4^\circ$$

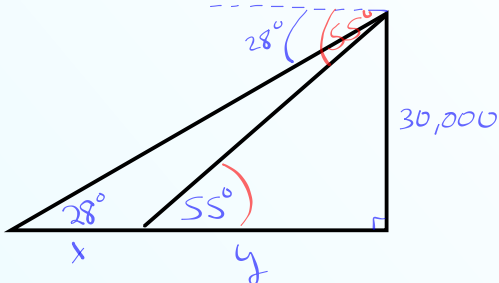
A passenger in an airplane flying at 30,000 feet sees two towns directly to the left of the plane.

The angles of depression to the towns are 28° and 55° . How far apart are the towns? Give answer to nearest tenth of a foot.



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$$\tan 55 = \frac{30,000}{y}$$

$$y = \frac{30,000}{\tan 55}$$

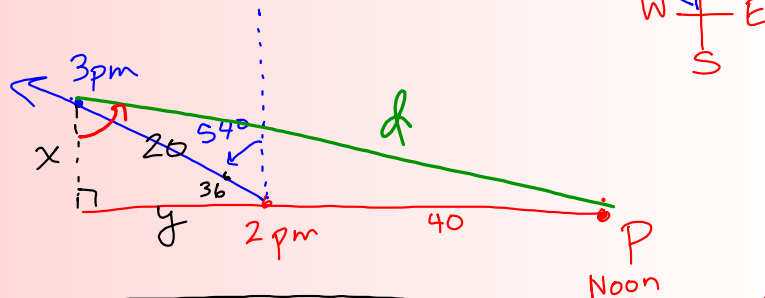
$$\tan 28 = \frac{30,000}{x + \frac{30,000}{\tan 55}}$$

$$x + \frac{30,000}{\tan 55} = \frac{30,000}{\tan 28}$$

$$x \approx 35,415.6 \text{ ft}$$

A ship leaves port at noon and heads due west at 20 knots. (nautical miles per hour) At 2pm, to avoid a storm, it changes course to N 54° W. Find the ship's distance from the port of departure at 3pm, to the nearest 10th of a nautical mile.

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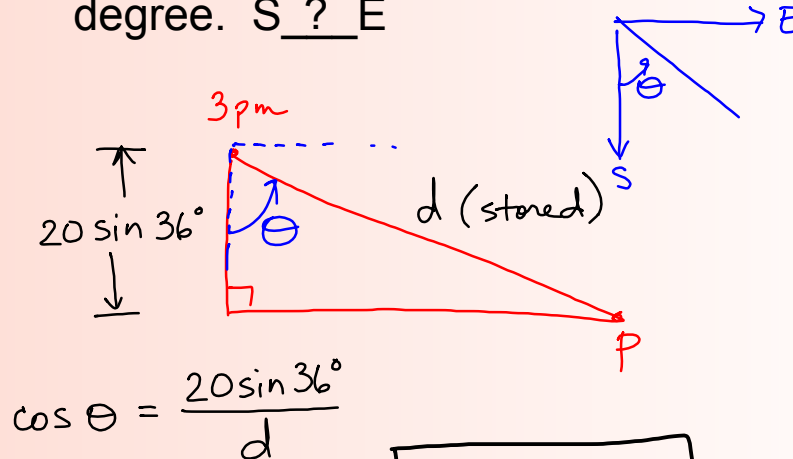


$$d = \sqrt{x + (y + 40)^2}$$

$$d \approx 57.4 \text{ nautical miles}$$

Find its bearing TO port to the nearest 10th of a degree. S ? E

Find its bearing TO port to the nearest 10th of a degree. S ? E



S 78.2° E

HW: PC book, p. 390 boxed,
and #21, 25, 29,
but skip 37, 41

Group Event Friday:
SL 9.1 and 9.7

Unit test next Monday:
PC Chapter 5 (we skipped 5.7)
and SL 9.1 and 9.7